http://www.banglajol.info/index.php/JNINB DOI: https://doi.org/10.3329/jninb.v6i1.48034

Case Article

Journal of National Institute of Neurosciences Bangladesh,
January 2020, Vol. 6, No. 1, pp. 67-71

ISSN (Online) 2518-6612
ISSN (Print) 2410-8030

Mandibular Primary First Molar with Single Root and Single Canal: A Rare Case Report

Tazdik G. Chowdhury[1], KM Rowank Jahan[2], Tasnim-A-Jannat[3], Ashik Abdullah Imon[4]

[1]Associate Professor and Head, Department of Paediatric Dentistry, Update Dental College and Hospital, Dhaka, Bangladesh; [2]Lecturer, Department of Paediatric Dentistry, Update Dental College and Hospital, Dhaka, Bangladesh; [3]Lecturer, Department of consevative dentistry & Endodontics, Update Dental College and Hospital, Dhaka, Bangladesh; [4]Assistant Professor and Head, Department of Oral and Maxillofacial Surgery, Update Dental College and Hospital, Dhaka, Bangladesh

[**Received:** 12 November 2019; **Accepted:** 20 December 2019; **Published:** 1 January 2020]

Abstract

An extremely uncommon tooth developmental anomaly seen such as bilateral primary mandibular first molar with a single root and single canal. Various researchers found that due to failure of invagination of HERS leads to various anomalies in root morphology. A 9 year old girl with pain on lower left side of the jaw originated from mandibular left first molar. On right side there was also presence of 84 with single root. The tooth was treated by pulpectomy followed by restoration. Due to unusual morphology, the chance of endodontic mishaps is extremely high in the search of additional canal, which can be overcome by proper knowledge of root morphology and radiographic interpretation. *[Journal of National Institute of Neurosciences Bangladesh, 2020;6(1): 67-71]*

Keywords: Mandibular first molar; bilateral, primary; single root; single canal

Correspondence: Dr. Tazdik G. Chowdhury, Associate Professor and Head, Department of Paediatric Dentistry, Update Dental College and Hospital. Cell no.: +8801711047904; Email: tazdikdentalsurgery@gmail.com

Conflict of interest: There is no conflict of interest relevant to this paper to disclose.

Contribution to authors: All the authors were involved from the diagnosis and management of the patients.

How to cite this article: Chowdhury TG, Jahan KMR, Tasnim-A-Jannat, Imon AA. Mandibular Primary First Molar with Single Root and Single Canal: A Rare Case Report. J Natl Inst Neurosci Bangladesh, 2020;6(1): 67-71

Copyright: ©2020. Chowdhury et al. Published by Journal of National Institute of Neurosciences Bangladesh. This article is published under the Creative Commons CC BY-NC License (https://creativecommons.org/licenses/by-nc/4.0/). This license permits use, distribution and reproduction in any medium, provided the original work is properly cited, and is not used for commercial purposes.

Introduction

The process of tooth eruption and root formation is a complex process[1]. Mesenchymal tissue during odontogenesis helps tooth formation which is the important component of functional cranial components consisting of enamel, dentine, cementum and pulp[2,6]. Dental pulp is an ectomesenchymal origin consisting of soft gelatinous connective tissue which is surrounded by bilayered mineralized tissue[3]. There is a link between root development and tooth eruption[4]. After crown formation, the meeting point of inner and outer epithelium called "zone of reflexion or cervical loop", the cell continue to divide and forms a double layer of cells as Hertwig's Epithelial root sheath[1,3]. It starts formation of root portion.

Root canals are larger in deciduous teeth as enamel and dentine is thinner and there is no clear demarcation between pulp chamber and root canals[5,6]. The HERS usually grows down and surrounds the entire dental papilla and the most apical portion of dental papilla represents the future apical foramen. Two tongue-like projections grow inward towards the center from the lateral walls of root sheath and finally when projections merge in the center, two rooted molar is develop. Three rooted molar develops with the three projections grow from the root sheath, dividing the developing root structure into three portions[7]. Thus failure of invagination of HERS leads to various anomalies in root morphology[8].

The success of root canal therapy is more challenging in anatomically variant root canal configuration in primary molars[9]. Thus proper knowledge of root morphology is necessary for communication,

diagnosis and treatment planning[6]. Single-rooted primary mandibular first molar is a very uncommon morphologic variation and few cases are noted[10].

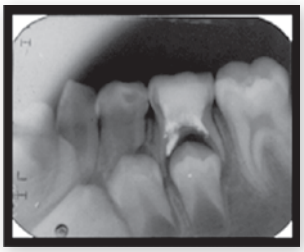
In routine dental practice, we use periapical radiograph to evaluate the root canal configuration but these techniques have some limitations that compromise their reliability[11,12]. Now-a-days computed tomography (CT) scan has been implemented to evaluate the three-dimensional anatomy of teeth and root canal morphology as well as unusual morphology of root canals[11,12]. In this article, we had present a rare case of bilateral mandibular primary first molar with single root and single canal.

Case Presentation

A 9 year old girl who had met with pain on lower left side of the jaw for last 3 days, before she visited the Department of Paediatric Dentistry, Update Dental College & Hospital, Dhaka, Bangladesh for the treatment of left 1st molar. Patient had met with secondary caries and she has History of taking Restoration one month before. She had chief complaint of pain, which was mild in nature, persistent and had started three days back. The patient was rated as No.4 on Frankl's Behavior Rating Scale (1962).Clinical examination with context to 74 revealed the crown size was normal with faulty restoration. We also get slight mobility of the teeth was within normal limits and depression of the tooth with digital pressure results in pain. With context to 74 and single rooted tooth with physiological resorption with presence of 34 was evident, on radiographic evaluation. On the basis of pain history and clinical examination, the case directed us as widespread inflammation of the pulp extending throughout the radicular filaments and radiologically was diagnosed as chronic irreversible pulpitis. On right side, there was also presence of 84 with single rooted and 85 with pulp therapy was found. Finally Single visit Pulpectomy was planned for the left primary mandibular first molar (74) followed by restoration, but stainless steel crown could not be given, as the parents were not keen about it. On the first appointment, after proper isolation access opening to root canal instrumentation was established by standardized technique. After working length determination (10 mm) biomechanical preparation was performed by using H- files. During working length determination two individual gutta percha was used to evaluate weather the canal type is Vertucci type IV rather than type I. Copious normal saline solution was used for irrigation of the canal throughout the biomechanical preparation. Finally obturation is done with calcium hydroxide based sealer (Metapex) in the canal to the desired length. Finally cavity is sealed with IRM. Five days later patient was recalled and temporary filling was removed and permanent restoration was done. Stainless steel crowns for the teeth could not be done as the parents did not want any further treatment.

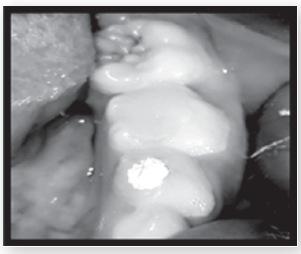
Clinical and Radiographic Presentation

Mandibular Left 1st Molar

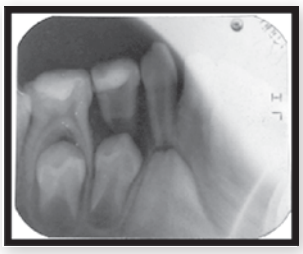


Mandibular Right 1st Molar

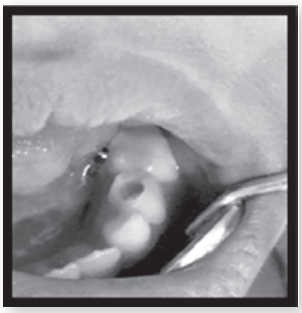
Clinical photograph



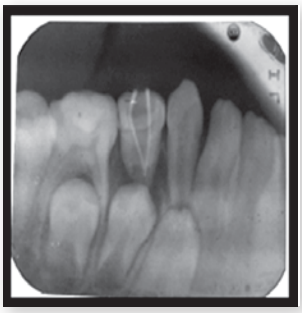
Initial Clinical photograph



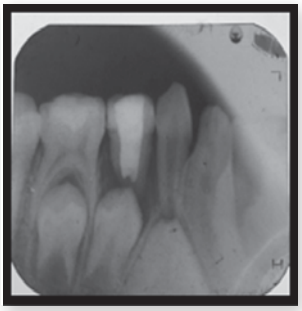
Initial radiograph



Access cavity preparation



Working Length Determination



After Obturation

After Restoration

Discussion

One of the important goal of paediatric dentistry is the preservation of primary teeth until eruption of permanent teeth for proper mastication, speech, aesthetics and correction of spacing[13].

The anatomy of primary root canal have been surveyed by very few researchers which are not consistent[14]. Bagherian and colleagues found in Iranian population that two roots with four canals in four deciduous mandibular first molars[15] Gupta et al[16] and Hibbard et al[17] also found same anatomy. The variations in the number of roots is shown in primary molars by various researchers[1,8].

Single rooted primary mandibular first molar is extremely rare physiology which was not documented until 1973. Acherman et al[24] and Gideon et al[29] found out the first case in 10 year old child. It can occur unilaterally or bilaterally with frequent involvement of permanent dentition than primary dentition[19]. It may be the cause of lack of proliferation of tooth germination from dental lamina and also some genes associated with tooth agenesis such as Msx 1 and PAX 9 have been identified[19].

It can cause the abnormalities such as fusion of roots or deep taurodontism characterized by apical displacement of pulpal floor and vertically elongated pulp chamber[20]. The other abnormalities associated with the odontogenic anomalies are oligodontia, hypodontia, macrodontia, dens invaginatus, idiopathic generalized short root and pyramidal molars[20]. Taurodontism and isolated pyramidal molars is found in 48.6% of cases[21]. The morphology of tooth development effects by several environmental factors like radiotherapy, chemotherapy and trauma[22]. It may be associated with fusion of the root or deep

Table 1: Different Number of Roots in Primary Teeth

Author	Year	Number of cases	Description of root anomaly
Ackerman et al[24]	1973	One	Single rooted Deciduous molars
Gideon et al[29]	1991	Two	Single rooted Deciduous and permanent molars
Anne Marie.H.Ngyen et al[30]	1996	One	Single rooted Deciduous and permanent molars
Chow et al[31]	1980	One	Bilateral double rooted maxillary Deciduous canines
Kelly's et al[32]	1978	One	Bilateral double rooted maxillary Deciduous canines
Krolls et al[33]	1980	One	Bilateral double rooted maxillary Deciduous canines
Micheal et al[34]	1997	Three	Double rooted maxillary left Deciduous canines.
			Three rooted Deciduous mandibular right first molar.
			Three-rooted Deciduous mandibular right first and second molars
Mochizuki et al[35]	2001	One	Double rooted maxillary Deciduous canines
Orhan[36]	2006	Three	Double rooted maxillary Deciduous canines
Mayhull et al[37]	1981	One	Three rooted Deciduous mandibular right first molar
Curzon et al[38]	1972	One	Three rooted Deciduous mandibular molars
Tratman et al[39]	1938	One	Three rooted Deciduous mandibular molars
Badger[40]	1982	One	Three- rooted mandibular first Deciduous molar
Falk et al[41]	1983	One	Bilateral three rooted mandibular first Deciduous molars
Acs et al[42]	1992	One	Three rooted Deciduous mandibular right first molar

taurodontism[23]. In our case such findings were absent. Some added radiograph with different horizontal angulation (20-degree mesial and distal angulation) is useful in evaluation of canal morphology[23].

Single rooted molar can describe by different terms, such as conical, fused and pyramidal[24]. With connected roots and two separate canals refers to fused roots and pyramidal roots refers to single enlarged root canal in a single tapering root[25]. In our case we found a pyramidal root. Also root abnormalities are more seen in females than males[26], as reported in our study. Causation of pyramidal root is due to failure of HERS to encircle completely the dental papilla during vertical growth or failure of the lateral tongue like projections to form completely[7].

Due to unusual morphology, the chance of endodontic mishaps is extremely high in the search of additional canal which can be overcome by proper knowledge of root morphology and radiographic technique[27]. Radiographs such as 20 degree mesial and distal projection or CT scan to access three dimensional anatomy of tooth and it's canal morphology helps to minimize the errors[28].

Conclusion

Due to unusual morphology, the chance of endodontic mishaps is extremely high in the search of additional canal, which can be overcome by proper knowledge of root morphology and radiographic interpretation.

References

1. Jeevanandan G, Subramanian E, Muthu MS. Single rooted primary first molars. Indian J Dent Res 2012;23:104-6
2. Jana S, Ghosh C, Dey B, Roy D. Primary Mandibular First Molar with Single Root and Single Canal: A Rare Morphology- A Report of Two Cases. Int J Oral Health Med Res 2016;3(1):137-139
3. Esmaeilzadeh M, Janeshin A, Donyavi Z, Single-Rooted Primary Mandibular First Molar: Report of a Rare Morphology. Avicenna J Dent Res. 2016: e26603
4. Asamassimo PS, Fields JH, McTigue DJ, Nowak A. Pediatric den¬tistry: infancy through adolescence: USA: Elsevier Health Sciences; 2013
5. Goerig AC, Camp JH. Root canal treatment in primary teeth: a review. Pediatric dentistry. 1983;5(1):33-7
6. Sarker S,Rao A.P. Number of Root Canals, their shape, configuration,accessory root canals in radicular pulp morphology.A preliminary study. J Indian Soc Pedo Prev Dent 2002;20(3):93-97
7. Ten Cate's AR. Oral histology: Development, structure, and function. 4th ed. St. Louis: Mosby; 1994;104-7.
8. Bahrololoomi1 Z, Ghafourifard R, Soleimani AA. Primary Mandibular First Molar with Single Root and Single Canal: A Case Report of a Rare Morphology. Journal of Dentistry, Tehran University of Medical Sciences 2014;11(3):355-360
9. Malagnino V, Gallottini L, Passariello P. Some unusual clinical cases on root anatomy of permanent maxillary molars. J Endod 1997;23(2):127–8.
10. Bahrololoomi Z, Ghafourifard R, Soleimani AA. Primary mandib¬ular first molar with single root and single canal: a case report of a rare morphology. J Dent.2014;11(3):355–60
11. Shigli A, Agrawal A. Permanent maxillary first molar with single root and single canal: A case report of a rare morphology . J Indian Soc Pedod Prev Dent 2010;28(2):121-5
12. Gopikrishna V, Bhargavi N, Kandaswamy D. Endodontic management of a maxillary first molar with a single root and a single canal diagnosed with the aid of spiral CT: a case re-port. J Endod 2006;32(7):687-91
13. Gupta S, Nagaveni NB, Chandranee NJ. Three rooted mandibular first primary molar: Report of three cases. Contemp Clin Dent 2012;3:S134-6
14. Mesbahi M, Talei Z, Mollaverdi F, Kadk-hodazadeh M. Comparison of root canal system configuration in primary teeth. Res J Biol Sci 2010;5(7):488-91
15. Bagherian A, Kalhori KA, Sadeghi M, Mir-hosseini F, Parisay I. An in vitro study of root and canal morphology of human deciduous molars in an Iranian population. J Oral Sci 2010;52(3):397-403
16. Gupta D, Grewal N. Root canal configura-tion of deciduous mandibular first molars – an in vitro study. J Indian Soc Pedod Prev Dent. 2005;23(3):134-7
17. Hibbard ED, Ireland RL. Morphology of the root canals of the primary molar teeth. J Dent Child 1957; 24:250-7
18. Demirbuga S , Sekerci A.E, Dinçer AN, Cayabatmaz AM, Zorba YO. Use of cone-beam computed tomography to evaluate root and canal morphology of mandibular first and second molars in Turkish individuals. Med Oral Patol Oral Cir Bucal 2013;18(4):e737-44
19. Thakar SS, Motghare V, Prabhakar I, Shivlingesh KK, Gupta B, Gupta N. Bilateral Presence of a Single Root in Mandibular Second Molars having a Single Non-Conical Canal Configuration: A Rare Case Report. Int J Adv Health Sci 2014; 1(3): 31-34.
20. Kamali A, Alipuriani Z. primary molar Ectodermal dysplasia: A rare case. Sch J Dent Sci 2017; 4(3):151-153
21. Salama F.S, Anderson R.W., McKnight-Hanes C, Barenie J.T, Myers D.R.Anatomy of primary incisor and molar root canals. Pediatric Dentistr 1992;14(2):117-118
22. Minicucci EM, Lopes LF, Crocci AJ. Dental abnormalities in children after chemotherapy treatment for acute lymphoid leukemia. Leuk Res 2003;27:45-50
23. De Moor RJ.C-shaped root canal configuration in maxillary first molars. Int Endod J 2002;35(2):200–8.
24. Ackerman JL, Ackerman AL, Ackerman AB. Taurodont, pyrami¬dal and fused molar roots associated with other anomalies in a kindred. Am J Phys Anthropol 1973;38(3):681–94.
25. Jeevanandan G, Subramanian E, Muthu MS. Single-rooted primary first molars. Indian J Dent Res. 2012;23(1):104–6.
26. Sujak SL, Abdul Kadir R, Dom TN. Esthetic perception and psycho¬social impact of developmental enamel defects among Malay-sian adolescents. J Oral Sci. 2004;46(4):221–6.
27. Wang Y.L, Chang H.H, Ching-I Kuo c,Chen S.K, Guo M.K, Huang G.F,Lin C.P .A study on the root canal morphology of primary molars by high-resolution computed tomography. Journal of Dental Sciences (2013) 8, 321-327
28. Bahrololoomi Z, Ghafourifard R, Soleimani A Primary Mandibular First Molar with Single Root and Single Canal: A Case Report of a Rare Morphology. J Dent (Tehran). 2014 May; 11(3): 355–360.
29. Holan G, Chosack A. Single-rooted molars in the primary and permanent dentition in two siblings: Case report. Pediatr Dent

1991;13:367-9.
30. Nguyen AH, Tiffee JC, Arnold RM. Pyramidal molar roots and caninelike dental morphologic features in multiple family members: A case report. Oral Surg Oral Med Oral Path Oral Radiol Endod 1996;82:411-6.
31. Chow MH. Bilateral double-rooted maxillary primary canines. Oral Surg 1980;49:379.
32. Kelly JR. Birooted primary canines. Oral Surg 1978;46:872.
33. Kroll SO, Donahue AH. Double rooted maxillary primary canines. Oral Surg 1980;49:379.
34. Winkler MP, Ahmad R. Multi-rooted anomalies in primary dentition of Native Americans. J Am Dent Assoc 1997;128:1009-11.
35. Mochizuki K, Ohtawa Y, Kubo S, Machida Y, Yakushiji M. Bifurcation, birooted primary canine: A case report. Int J Paediatr Dent 2001;11:380-5.
36. Orhan AL, Sasi S. Double rooted maxillary primary canines: A report of three cases. J Indian Soc Pedod Prev Dent 2006;24:204-8.
37. Mayhall JT. Three-rooted deciduous mandibular second molars. J Can Dent Assoc 1981;47:319-21.
38. Curzon ME, Curzon JA Three-rooted mandibular molars in the Keewatin Eskimo: Its relationship to the prevention and treatment of caries. J Canad Dent Assoc 1972;38:152.
39. Tratman EK. Three-rooted molars in man and their racial distribution. Br Dent J 1938;64:264-74.
40. Badger GR. Three-rooted mandibular first primary molar. Oral Surg 1982;3:547.
41. Falk WV, Bowers DF. Bilateral three-rooted mandibular first primary molar-report of case. ASDC J Dent Child 1983;50:136-7.
42. Acs G, Pokala P, Cozzi E. Shovel incisors, three-rooted, talon cusp, and supernumerary tooth in one patient. Pediatr Dent 1992;14:263-4.